

# EPOXY CRACK SEALING

May 22, 1995

## Description

The Contractor shall seal all cracks in concrete designated in the Plans or by the Engineer in accordance with this Special Provision.

## Materials

The epoxy sealing paste shall be a thixotropic compound.

The epoxy injection resin shall be a moisture-insensitive, two-component material capable of structurally bonding cracks, delaminations and hollow Planes, and restoring the structural integrity of a structure. Resin formulations shall be hydrophilic with variable viscosity to allow full depth penetration in all cracks having a width of 0.15 millimeters and greater.

The resin, when mixed with the hardener in accordance with the manufacturer's written instructions, shall cure to a non-shrink solid material. The material shall have a normal curing time of less than 24 hours.

The epoxy injection resin shall have the following physical properties:

1. Solids Content (by weight)	98 percent (minimum)
2. Viscosity at 25 degrees C (Brookfield)	700 cps (maximum)
3. Compressive Yield Strength	83 MPa (minimum)
4. Flexural Strength (ASTM D 790)	69 MPa (minimum)
5. Bond Strength	3.5 MPa (minimum)

To qualify a material, the Contractor shall submit a sample of the material together with sufficient directions and technical data for its use to the Engineer. The Washington State Department of Transportation will then conduct such investigations and testing as are deemed necessary to verify that the material meets the specified requirements.

## Construction Requirements

The areas where cracks occur shall be cleaned of efflorescence, deteriorated concrete and other surface debris. Cleaning shall be accomplished by vacuuming, flushing, routing, sawing or other means as required.

Entry ports shall consist of tubes, tees or other valve devices suitable for accepting epoxy injection resins under pressures recommended by the resin manufacturer. The ports shall be placed at intervals along each crack in accordance with the manufacturer's written instructions for the resin being used. The holes for the entry ports shall be drilled with a hollow bit with an attached vacuum chuck to prevent concrete dust from becoming embedded in the crack.

The exposed crack surfaces and the areas around the entry ports shall be sealed with epoxy sealing paste. The sealing paste shall be allowed to cure in accordance with the manufacturer's written instructions so as to attain a seal capable of withstanding the applied injection pressures.

Injection shall be accomplished with a pressure or injection machine compatible with the resin selected for use and shall begin at the lowest port and continue until there

1 is evidence of the resin at the entry port directly above and adjacent to the port being  
2 pumped. When material travel is indicated, the nozzle shall be moved to the port  
3 that shows resin. The previously pumped port shall be sealed. Injection shall  
4 continue until the crack is completely filled. On wide cracks where resin travel  
5 between ports will be rapid, two or more ports may be pumped simultaneously. On  
6 exceptionally large cracks, a formulation (dependent upon crack width, ambient  
7 temperature, modulus requirements and other variables) of epoxy resin and fine  
8 sands shall be used as approved by the Engineer.

9  
10 After all ports have been pumped and the crack is full, the epoxy resin shall be  
11 allowed to cure without disturbance in accordance with the manufacturer's written  
12 instructions as necessary to ensure development of the full bond capacity of the  
13 material.

14  
15 After the epoxy has been allowed to cure completely, the epoxy sealing paste and  
16 port stems shall be ground flush with the original surface of the concrete.

17  
18 The Contractor shall furnish the services of a factory trained technical representative  
19 to perform the epoxy crack sealing injection.

20  
21 Cores shall be taken for inspection after the repair is completed to confirm  
22 penetration and bonding. These cores shall be submitted to the Engineer for testing  
23 in the Washington State Department of Transportation Materials Laboratory.

24  
25 The materials being used may be dermatetic. Precautions shall be taken to avoid  
26 contact with skin. Personnel shall be provided with approved safety goggles and  
27 gloves.

28  
29 Precautions shall be taken to eliminate sources of ignition where flammable cleaning  
30 solvents are present.

31  
32 **Measurement**

33 Measurement for this item of work will be by the meter along the sealed crack at the  
34 surface of the concrete.

35  
36 **Payment**

37 The unit contract price per meter for "Epoxy Crack Sealing" shall be full pay for  
38 performing the work as specified.